

TELEGRAPHIC MESSAGE

Federal Aviation Administration 800 Independence Avenue, SW Washington, DC 20591	PRECEDENCE: NORMAL ACTION: ROUTINE	SECURITY CLASSIFICATION <h2 style="text-align: center;">Unclassified</h2>
ACCOUNTING CLASSIFICATION	DATE PREPARED: 07/14/11	FILE:
FOR INFORMATION	CALL	
NAME JACK CORMAN	PHONE NUMBER (405) 954-4164	TYPE OF MESSAGE _ SINGLE _ BOOK <u>X</u> MULTI ADDRESS

MESSAGE TO BE TRANSMITTED *(Use double spacing and all capital letters)*

To:	<p>KRWA NOUS2 200400</p> <p>GENOT RWA 11/22</p> <p>N 8260.72</p> <p>GG ALRGNS 1/200/600</p> <p>AAS-100, AJV-3, AJV-E2, AJV-C2, AJV-W2</p> <p>ALL AFS-400</p> <p>XVM</p> <p>EFFECTIVE: 07/14/2011</p> <p>CANCELLATION: 07/14/2012</p> <p>SUBJECT: PERFORMANCE BASED NAVIGATION (PBN) FLY-BY (FB)/RADIUS-TO-FIX (RF) TURN MAXIMUM DESIGN BANK ANGLE LIMITS</p> <p>THIS NOTICE CANCELS GENOT 8260.71, OF 4/25/2011, SUBJECT: "CHANGE TO ORDER 8260.52, CHAPTER 1, TABLE 1-4". USERS ARE DIRECTED TO AFS-400 MEMORANDUM, SUBJECT: "PERFORMANCE BASED NAVIGATION (PBN) FLY-BY (FB)/RADIUS-TO-FIX (RF) TURN MAXIMUM DESIGN BANK ANGLE LIMITS," DATED 07/15/2011, FOR INSTRUMENT FLIGHT PROCEDURES (IFP) DESIGNED IN TERMINAL AND TRANSITIONS FROM EN ROUTE TO</p>
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TERMINAL OPERATIONS BELOW 19,500 FT MEAN SEA LEVEL (MSL).
THIS MEMORANDUM IS LOCATED ON THE AFS-420 WEBSITE AT THE
FOLLOWING INTERNET ADDRESS:

[HTTP://WWW.FAA.GOV/ABOUT/OFFICE_ORG/HEADQUARTERS OFFICES/AVS/OFFICES/AFS/AFS400/AFS420/POLICIES GUIDANCE/MEMO TILLS/PBN_FB-RF_TURN_MAX_BA_LIMITS.PDF.](http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/afs/afs400/afs420/policies_guidance/memo_tills/pbn_fb-rf_turn_max_ba_limits.pdf)

QUESTIONS MAY BE DIRECTED TO RICK DUNHAM, FLIGHT
STANDARDS SERVICE, FLIGHT PROCEDURE STANDARDS BRANCH,
AFS-420, AT 405-954-4164.

ORIGINAL SIGNED BY

John W. McGraw

for JOHN M. ALLEN

DIRECTOR, FAA FLIGHT STANDARDS SERVICE (AFS-1)

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Federal Aviation Administration

Memorandum

Date: JUL 15 2011
To: Chas. Frederic Anderson, Acting Director, Aeronautical Products, AJV-3
From: Leslie H. Smith, Manager, Flight Technologies and Procedures Division, AFS-400
Subject: Performance Based Navigation (PBN) Fly-By (FB) /Radius-to-Fix (RF) Turn Maximum Bank Angle Limits

This memorandum provides guidance and supersedes all previous guidance on the maximum bank angle design limits for FB and RF turns. It is applicable to PBN instrument procedures: area navigation (RNAV), required navigation performance (RNP), and RNP with authorization required (RNP AR). GENOT 8260.71 is cancelled.

For terminal and transitions from en route to terminal operations, the following two rules are added to design standards to determine the maximum bank angle limit for use in procedure design for FB and RF turns at and below 19,500 feet above mean sea level:

1. **FB Rule:** The maximum design bank angle is:
 - a. For track change less than 50 degrees: one half the magnitude of track of change; e.g., a 44 degree turn maximum bank angle is 22 degrees (RNP/ATT less than 1.0, the maximum bank angle is 20 degrees regardless of the track change).
 - or
 - b. For track changes equal to or greater than 50 degrees: 25 degrees (20 degrees for RNP/ATT less than 1.0).

***EXCEPTION:** Where a minimum segment length is necessary for design and application of paragraph 1a is required, but not operationally acceptable, it may be ignored if the succeeding segment is compliant with minimum segment length and bank angle rules.*

2. **RF Rule:** Calculate RF bank angle based on the design radius not to exceed 23 degrees (20 degrees for RNP/ATT values less than 1.0).

RF turn bank angles greater than the above require an approved waiver of this standard. The waiver request must list actions taken to provide an equivalent level of safety to that provided by the standard. The actions taken will be analyzed by the AFS-400 procedure review board (PRB) to determine sufficiency.

3. **Both FB and RF:** The maximum bank angle below 500 feet above airport elevation is 3 degrees.

The memorandum will be incorporated into Order 8260.PBN. If you have any questions, please contact Mr. Rick Dunham, Manager, Flight Procedure Standards Branch, AFS-420, at (405) 954-4164.

cc:

Elizabeth Ray, Vice-President, Mission Support Services, AJV-0
Wayne D. Fetty, United States Air Force Instrument Procedures Center (IPC)
Daniel E. Lehman, United States Naval Flight Information Group
Mark Meservey, United States Coast Guard C-130H Platform Manager
James M. Foster, United States Army Instrument Procedures Branch Manager
Jeff Bruce, Airspace Design and Simulation, Jeppesen Sanderson, Inc.
Giovanni Spitale, General Manager, Naverus-GE Aviation, PBN Services
Greg Keller, Satellite Technologies International (STI), Inc.
Steve Hickok, Hickok and Associates, Inc.